

Begin

Reel #517
Shtol'ts, S.K.

DOROGOVY, A.I., pochved, kandidat sel'skokhozyaystvennykh nauk;
MOISEYCHENKOV, G.I., inzhener-gidrotekhnik; SHTOL'TS, S.K., lesoved;
MALYSHEV, A.M., agronom, kandidat sel'skokhozyaystvennykh nauk;
KAZACHENKO, B.V., agronom [deceased]; RADZHUVETT, A.P., krayeved;
PONOMAREVA, A.A., entomolog; ANUFRIYEV, P., redaktor; BANNIKOV, P.,
redaktor; GORENSETYIN, G., tekhnicheskii redaktor.

[Nature in Penza Province] Priroda Pensenskoï oblasti. Penza,
Pensenskoe kn-vo, 1955. 458 p. (MIRA 9:6)
(Penza Province--Natural history)

SHTOL'TS, Ye. V.
SHTOL'TS, Ye. V.; SHUR, Ya. S.

Anisotropy of the magnetic properties of powdered MnBi alloys.
Dokl. AN SSSR 95 no. 4: 781-784 Ap '54. (MLRA 7:3)

1. Institut fiziki metallov Ural'skogo filiala Akademii nauk SSSR.
(Manganese-bismuth alloys) (Powder metallurgy)

USSR/Magnetism - Ferromagnetism

F-4

Abs Jour : Referat Zhur - Fiziks, No 5, 1957, 12005

Author : Shur, Ya.S., Shtol'ts, Ye.V., Kandayrova, G.S.

Inst : Institute of Physics of Metals, Ural' Branch, Academy of Sciences, USSR, Sverdlovsk.

Title : Features of the Process of Technical Magnetization in Textured Specimens Made of Fine Powders.

Orig Pub : Fiz. metallov i metallovedeniye, 1956, 2, No 3, 569

Abstract : Certain results are reported on the investigation of longitudinally-textured specimens made of fine powders of a MnBi alloy. The course of the magnetization curve depends substantially on the method of the demagnetized state is reached. Under certain demagnetization methods, the saturation magnetization in the measurement of the magnetization curve of the specimen is reached at fields that are

Card 1/2

Shtol'ts, Ye. V.
USSR/Magnetism - Ferromagnetism

F-4

Abs Jour : Referat Zhur - Fizika, No 5, 1957, 12006
Author : Shur, Ya.S., Kandaurova, G.S., Shtol'ts, Ye.V., Bilatova, I.V.
Inst : Institute of Physics of Metals, Ural' Branch, Academy of Sciences, USSR, Sverdlovsk.
Title : Investigation of Magnetization Processes in a High-Coercive MnBi Alloy by Means of Powder Patterns.
Orig Pub : Fiz. metallov i metallovedeniye, 1956, 3, No 1, 191-192
Abstract : The magnetic structure of the MnBi alloy and its variation in the magnetic field were studied. The specimens had $H_c \sim 1,000$ oersted and consisted of individual particles of a MnBi alloy measuring ~ 15 -- 20 microns, insulated by layers of Bi. In certain crystals there were observed on a plane parallel to the hexagonal axis

Card 1/2

5270170 Ye
AUTHORS: Shur, Ya. S., Shtol'ts, Ye. V., Kandaurov, Bulatova, L. V.

TITLE: On the Domain Structure of the High Coercitivity Manganese-Bismuth Alloy. (O domennoy strukture vysokokoertsitivnogo splava marganets-vismut).

PERIODICAL: Fizika Metallov i Metallovedeniye, 1957, Vol.5, No.3, pp. 234-240 (USSR)

ABSTRACT: On the basis of available information on high coercitivity alloys, it can be assumed that the distinguishing feature of this class of ferromagnetics is the presence in these of a single domain structure, as a result of which the magnetization is effected in such ferromagnetics by rotation processes. The high coercitivity state can occur only if the single domains have a high magnetic anisotropy. However, within the framework of this conception it is not possible to explain some of the phenomena which were observed earlier by the author and his team in high coercitivity ferromagnetics, for instance, the magnetic temperature hysteresis (Ref.1), the magnetic viscosity (Ref.2), particular properties of magnetically anisotropic specimens produced from powders of the manganese-bismuth alloy (Ref.3). Therefore, it is made by did not allow any structure of the high on the magnetization

126-2-6/35

On the Domain Structure of the High Coercitivity Manganese-Bismuth Alloy.

sintering the specimen consists of formations of the manganese-bismuth compound with dimensions of 15 to 20 μ separated by interlayers of bismuth and manganese; the specimens had a coercive force of the order of 1000 Oe. The results are described and the powder patterns are reproduced in a number of photographs. These show that in a manganese-bismuth alloy consisting of MnBi crystallites of sizes of 15 to 25 μ and separated from each other by non-ferromagnetic interlayers, the process of remagnetization parallel to the axis of the easiest magnetization can proceed in the following two ways: by the formation of nuclei, their growth and transformation of some of these in the range of reversible magnetization and a displacement of 180° boundaries between the individual areas, whereby a coercive force of 1000 Oe can be achieved; solely by rotation which is achieved if the magnetizing force is adequate for annihilating the remagnetization nuclei, which excludes occurrence of closing areas, and in this case the coercive force can reach several thousand Oe. Apparently the revealed features are due to the fact that the dimensions in the investigated crystallites are near to the critical size

Card 3/4

On the Domain Structure of the High Coercitivity Manganese-Bismuth Alloy.

126-2-6/35

of transition to the single domain structure. It can be assumed that in other high coercive materials a similar character of the remagnetization processes take place but in ferromagnetics with a magnetic anisotropy smaller than the MnBi alloy it should be possible to observe this phenomenon in the case that the individual ferromagnetic formations are of smaller sizes. There are 3 figures and 8 references, 4 of which are Slavic.

SUBMITTED: March 21, 1957.

ASSOCIATION: Institute of Metal Physics, Ural Branch of the Ac.Sc. U.S.S.R. (Institut Fiziki Metallov Ural'skogo Filiala AN SSSR).

AVAILABLE: Library of Congress.

Card 4/4

126-5-3-6/31

AUTHORS: Shtol'ts, Ye. V., Shur, Ya. S. and Kandaurova, G. S.

TITLE: Magnetic Properties of Magnetically Anisotropic Specimens of Ferromagnetic Powders (Magnitnyye svoystva magnitno-anizotropnykh obraztsov iz ferromagnitnykh poroshkov)
I. Magnetization Curves and Partial Cycles of Hysteresis Loops (I. Krivyye namagnichivaniya i chastnyye tsikly petel' gisterezisa)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1957, Vol V, Nr 3, pp. 412-420 (USSR)

ABSTRACT: The magnetization curves and particularly the hysteresis loops have been investigated by the authors on MnBi specimens which were produced by sintering powders of manganese and bismuth at 550°C for two hours. The coercive force of the alloy amounted to 80 Oe. The MnBi powder was obtained by mechanical crushing and subsequent sorting into fractions with various particle sizes between 1.2 mm and 3μ. The investigated specimens were cylindrical and they were produced as follows: the powder was carefully mixed with the binding substance, an appropriate mould was filled with the mixture. Following that, the mould with the powder was exposed to a magnetic field and the Card 1/3 hardening was effected in the magnetic field. (The angle

Magnetic Properties of Magnetically Anisotropic Specimens of
Ferromagnetic Powders 126-5-3-6/31

between the texture and the specimen axis is denoted by ϕ .)
A dependence is established of the character of the
anisotropy of ^{the} magnetization curves of magnetically textured
specimens, made of thin powder of the MnBi alloy, on the
dimensions of the powder particles. For certain particle
dimensions, a magnetization process is observed in the
longitudinally textured specimens which manifests itself
in the fact that saturation is reached in fields of lower
intensity than the maximum values of the residual
magnetization and the coercive force. On the basis of
the measured magnetization curves and of particular
hysteresis cycles of isotropic and magnetically textured
specimens of Mn-Bi alloys of various degrees of
dispersion, it was established that in fine powders a
magnetic transition structure from the multi-domain to the
single-domain one as well as a single-domain structure can
exist. A model of the transient magnetic structure is
put forward.

Card 2/3 There are 9 figures, 1 table and 7 references, 6 of which
are Soviet and 1 French.

126-5-3-6/31

Magnetic Properties of Magnetically Anisotropic Specimens of Ferromagnetic Powders

ASSOCIATION: Institut Fiziki Metallov Ural'skogo Filiala AN SSSR
(Institute of Metal Physics, Ural Branch of the Ac.Sc., USSR)

SUBMITTED: May 17, 1957

- 1. Metal powders--Magnetic properties
- 2. Ferromagnetic materials
- Preparation
- 3. Hysteresis

Card 3/3

126-5-3-7/31

AUTHORS: Shur, Ya. S., Shtol'ts, Ye. V. and Kandaurova, G. S.

TITLE: The Magnetic Properties of Magnetically Anisotropic Specimens Made of Ferromagnetic Powders (Magnitnyye svoystva magnitno-anizotropnykh obraztsov iz ferromagnitnykh poroshkov) II. The Dependence of the Curves of Magnetization on the Method of Obtaining the Demagnetised State (II Zavisimost' krivyykh namagnichivaniya ot sposoba polucheniya razmagnichennogo sostoyaniya)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1957. Vol.V, Nr 3, pp 421-427 (USSR)

ABSTRACT: A series of powders each with a uniform particle size, lying in the range 250 to 4 μ , was made from a manganese-bismuth alloy containing about 50% ferromagnetic phase. Magnetised dies were prepared from the powders by mixing them with a suitable filler, pouring into a mould, fusing at about 60 $^{\circ}$ C and cooling in a magnetic field. The dies were then demagnetised either by cooling to -196 $^{\circ}$ C in an alternating field, or at room temperature, by using a field of variable magnitude but constant sign to return the material to the demagnetised state from the appropriate point on one or other branch of the hysteresis loop. A part of the paper is devoted to the study of

Card 1/3

126-5-3-7/31

The Magnetic Properties of Magnetically Anisotropic Specimens Made of Ferromagnetic Powders II. The Dependence of the Curves of Magnetization on the Method of Obtaining the Demagnetised State

these 'curves of return'. Subsequent remagnetization to saturation was shown to follow a course dependent on the mode of demagnetization. Demagnetization by the first method permitted rapid remagnetization. After demagnetization at room temperature by a field of the same sign as the original magnetization, the remagnetization curve assumed a step-like form except at large particle sizes. If, however, the specimen was demagnetised by a field of opposite sign, remagnetization proceeded comparatively smoothly except at the lowest particle sizes when the curve again had a step-like appearance. An attempt is made to explain the observations qualitatively in terms of a transient magnetic structure intermediate between the single and many domained types. In presence of such a structure in the direction along the axis of the texture of magnetically anisotropic specimens, a fundamental role in the process of magnetization is played by the hysteresis in the formation and growth of remagnetization nuclei.

Card
2/3

There are 8 figures and 2 references, both of which are Soviet.

The Magnetic Properties of Magnetically Anisotropic Specimens Made
of Ferromagnetic Powders II. The Dependence of the Curves of
Magnetization on the Method of Obtaining the Demagnetised State

126-5-3-7/31

ASSOCIATION: Institut fiziki metallov Ural'skogo filiala AN SSSR
(Institute of Metal Physics, Ural Branch of the Ac.Sc.,
USSR)

SUBMITTED: May 17, 1957

1. Metal powders--Magnetic properties 2. Ferromagnetic materials
--Test methods

Card 3/3

Shtol'ts, Ye. V.

AUTHORS. Shur, Ya. S., Shtol'ts, Ye. V., Kandaurova, G. S. 1957-1/26

TITLE. A Note on the Peculiarities of the Technical Magnetization of Fine Powder Samples with Texture (Osobennosti protsessov tekhnicheskogo namagnichivaniya v teksturovannykh obraztsakh iz tankikh poroshkov).

PERIODICAL, Izvestiya AN SSSR Seriya Fizicheskaya, 1957, Vol. 21, Nr 2, pp. 1215-1219 (USSR).

ABSTRACT. The purpose of this paper was the investigation of the peculiarities of the magnetic properties of powders consisting of particles with a size approaching the critical dimensions. The single axis Mn-Bi alloy utilized here displays an anisotropy of $-K \sim 10^4$ erg.cm⁻³, being the largest among the ferromagnetica. It was established, that a reduction of the size of the particles lead to a essential modification of the magnetic properties. The investigation of the magnetic properties of fine highly coercive powders showed, that the existence of a magnetic transition texture in particles with a size larger than the critical dimensions must be assumed. In such cases the particles contain blocking domains apart from the basic domains. Upon certain conditions these blocking domains vanish and then the magnetic reversal process takes place just like in one-domain particles. Among other influences the blocking domains play a leading rôle in the

Card 1/2

SOV/126-6-2-5/34

AUTHORS: Kandaurova, G. S., Shur, Ya. S. and Shtol'ts, Ye. V.

TITLE: The Magnetic Properties of Magnetically Anisotropic Specimens Prepared from Ferromagnetic Powders.
(Magnitnyye svoystva magnitno-anizotropnykh obraztsov iz ferromagnitnykh poroshkov). III. Anisotropy in Magnetic Properties (Anizotropiya magnitnykh svoystv)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 6, Nr 2, pp 229-236 (USSR)

ABSTRACT: The domain structures of powders of MnBi alloy and Co are determined from disc-shaped specimens prepared from powders of 1 to 100 μ in particle size. The Mn-Bi alloy was prepared by sintering the components at 320°C; MnBi content about 50%. The sinter was powdered and used without annealing. The Co was powdered from a piece of cast metal and annealed in vacuo at 600°C. (The method of preparing the discs is not described). Fig.1 shows the magnetization curve for an MnBi disc of particle size 25 μ , with various angles ϕ between the field and texture axes. Fig.2 gives the corresponding hysteresis loops. Fig.3 shows a polar diagram of the coercive force for MnBi discs of various particle sizes (texture

Card 1/3

SOV/126-6-2-5/34

The Magnetic Properties of Magnetically Anisotropic Specimens
Prepared from Ferromagnetic Powders. III. Anisotropy in Magnetic
Properties

axis horizontal). Fig.4 shows how the coercive force of MnBi varies with particle size for two values of ϕ ; Fig.5 resembles Fig.3 but the residual magnetization is shown instead. Figs. 6 and 7 are analogous to Figs. 1 and 3 respectively, for Co powder of 4μ particle size; Fig.8 is analogous to Fig.4 and Fig.9 to Fig.5. The results are discussed in the light of the prediction that single-domain particles should occur in larger sizes the higher the anisotropy constant and saturation magnetization. The results agree with this prediction in general, but the precise shapes of the theoretical curves (shown dashed in Figs.10 and 11) are not the same as those found by experiment for MnBi of 4μ particle size. Some of these effects can be attributed to the method used for demagnetizing the MnBi powder (decreasing alternating

Card 2/3

SOV/126-6-2-5/34

The Magnetic Properties of Magnetically Anisotropic Specimens
Prepared from Ferromagnetic Powders. III. Anisotropy in Magnetic
Properties

field at liquid nitrogen temperature).

There are 4 equations, 11 figures and 8 references,
6 of which are Soviet, 2 English.

ASSOCIATION: Institut fiziki metallov Ural'skogo filiala AN SSSR
(Institute of Metal Physics, Ural Branch of the Ac.Sc.,
USSR) and
Ural'skiy gosudarstvennyy universitet imeni A.M.Gor'kogo
(Ural State University imeni A. M. Gorkiy)

SUBMITTED: May 17, 1957

Card 3/3 1. Ferromagnetic materials--Magnetic properties 2. Alloys--
Sintering 3. Powders--Applications 4. Alloys--Heat treatment

SOV/126-6-3-5/32

AUTHORS: Shur, Ya. S., Shtol'ts, Ye. V. and Randaurova, G. S.

TITLE: Magnetic Properties of Magnetically Anisotropic Specimens of Ferro-magnetic Powders. IV. Temperature Dependence of Magnetic Properties of Powdered Specimens of the Alloy MnBi (Magnitnyye svoystva magnitno-anizotropnykh obraztsov iz ferromagnitnykh poroshkov. IV. Temperaturnaya zavisimost' magnitnykh svoystv poroshkovykh obraztsov splava MnBi)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 6, Nr 3, pp 420-425 (USSR)

ABSTRACT: Previous papers of this series were published in Nos 5 and 6 of the present journal (1957, Refs.1-3). The anisotropy of the coercive force in powdered specimens of MnBi in the temperature region -196 to +20°C has been studied and results are now reported. A study was made of the magnetisation curves, recovery curves and other features of the hysteresis loops at a temperature of -196°C. It is shown that when the temperature of finely powdered specimens is reduced from +20° to -196°C, the form of the magnetic structure of the particles changes due to a reduction in the constant of anisotropy. A study of the temperature dependence of the magnetic properties of specimens of MnBi powders of different dispersity has shown that in the same

Card 1/2

SOV/126-6-3-5/32

Magnetic Properties of Magnetically Anisotropic Specimens of Ferro-Magnetic Powders. IV. Temperature Dependence of Magnetic Properties of Powdered Specimens of the Alloy MnBi

specimens at different temperatures the existence of magnetic structure of different form may be observed. Thus, the transition structure which is present at room temperature in fine powders (1 - 10 μ) disappears at -196°C and instead of it a multidomain structure is found. This is connected with the reduction in the constant of anisotropy at low temperatures. There are 6 figures, 1 table and 11 references, of which 8 are Soviet, 2 French and 1 German.

ASSOCIATION: Institut fiziki metallov Ural'skogo filiala AN SSSR
(Institute of Physics of Metals, Urals Branch, Academy of Sciences USSR)

SUBMITTED: June 21, 1957.

1. Bismuth-manganese powder alloys--Magnetic properties
2. Bismuth-manganese powder alloys--Temperature factors

Card 2/2

AUTHORS: Shtol'ts, Ye. V., Shur, Ya. S., SOV/48-22-10-20/23
~~Kandareva, G. S.~~

TITLE: On the Anisotropy of the Coercive Force in Magnetically
Anisotropic Samples of Fine Powder (Ob anizotropii
koertsitivnoy sily v magnitnoanizotropnykh obraztsakh iz
tonkikh poroshkov)

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1958,
Vol 22, Nr 10, pp 1269 - 1272 (USSR)

ABSTRACT: In the present paper the authors give a report on measure-
ments of the coercive force of uniaxial magnetic powder
produced from the following substances: Cobalt, Mn-Bi-
alloy, magnetite, and iron- γ -oxide. The angular dependence
of the coercive force of various powder samples is shown
in figure 1. A comparison of the curves shows that in
textured samples made of magnetically uniaxial powders the
angular dependences of H_c may exhibit a different character.
The process of the technical magnetization in directions
close to the axis of texture differs from the process of
irreversible rotation. Probably this is caused by the fact

Card 1/4

On the Anisotropy of the Coercive Force in
Magnetically Anisotropic Samples of Fine Powder

SOV/48-22-10-20/23

that the one-domain structure in the particles has not yet completely been reached. The investigation of other rules governing the magnetic properties of fine powders results in the assumption that these particles exhibit a particular domain structure (Ref 4): In one particle only one basic domain and several closing domains exist. As a consequence of this the formation, the growth, and the diminution of the closing domains plays a decisive role in the process of technical magnetization. The assumption of the existence of such a domain structure is confirmed by observations of powder patterns (Ref 5). In the case of a poly-domain structure the coercive force varies inversely as $\cos \varphi$ (Ref 6).

Therefore the coercive force increases with increasing angle φ . A complicated dependence of $H_c(\varphi)$ exhibiting a

maximum at a certain value of φ which varies between $\varphi = 0$ and $\varphi = 90^\circ$ may be expected. Such a regularity was observed in samples of cobalt, magnetite, and iron- γ -oxide powder. In this case the structure apparently approximates the poly-domain structure. The magnitude of H_c of these powders,

Card 2/4

On the Anisotropy of the Coercive Force in
Magnetically Anisotropic Samples of Fine Powder

SOV/48-22-10-20/23

however, is considerably higher than that of the respective massive substances. In the examined substances a change of the anisotropic character was not observed when the dimensions of the particles were modified. A change in the anisotropy of H_c together with the diminution of the particles was found in the investigation of magnetically anisotropic samples consisting of powder of the "low-coercive" Mn-Bi alloy. The dependence of H_c (φ) found in this instance is given in figure 2. In powder of the low-coercive Mn-Bi alloys the diminution of the particles leads to a change in their magnetic structure which can be determined from the shape of the angular dependence of the coercive force. The observation results and their analysis show that in magnetically anisotropic ferromagnetics the data on the anisotropy of the coercive force besides other characteristics may give certain indications concerning the magnetic structure. There are 2 figures and 7 references, 5 of which are Soviet.

Card 3/4

On the Anisotropy of the Coercive Force in
Magnetically Anisotropic Samples of Fine Powder

SOV/48-22-10-20/23

ASSOCIATION: Institut fiziki metallov Akademii nauk SSSR (Institute of
Metal Physics, AS USSR) Fiziko-matematicheskii fakul'tet
Ural'skogo gos. universiteta (Physics and Mathematics
Dept. at the Ural State University)

Card 4/4

67753

24.2200
12.6100

SOV/126-8-5-5/29

AUTHORS: Shur, Ya.S., Shtol'ts, Ye.V., Kandaurova, G.S., and Redneva, L.V.

TITLE: The Temperature Dependence¹ of Magnetic Properties² of MnBi Alloy Powder Samples with Magnetic Texture

PERIODICAL: Fizika metallov i metallovedeniye, Vol 8, 1959, Nr 5, pp 678-684 (USSR)

ABSTRACT: The authors studied the temperature dependence of magnetic properties of samples made of the MnBi alloy powder. This alloy has a very high magnetic anisotropy constant K at room temperature (Ref 4) and a high value of the critical particle size, d_{cr} (below this size the powder particles exist in monodomain state only). On lowering of temperature the value of K falls sharply and this is accompanied by a sharp fall of the critical particle size d_{cr} , which is a function of K . It follows that on lowering of temperature the magnetic structure of MnBi alloy powders will be altered (a polydomain-monodomain transition will occur) and this change of structure will affect some magnetic properties. Consequently we can make some deductions about the structure of this magnetically uniaxial material from

Card
1/5

67753

SOV/126-8-5-5/29

The Temperature Dependence of Magnetic Properties of MnBi Alloy Powder Samples with Magnetic Texture

the temperature dependence of its magnetic properties. The alloy was produced by heating powders of Mn and Bi together at 300 °C and its coercive force was of the order of 1000 Oe. The alloy was powdered mechanically and several fractions of the powder with particle size from 2 to 20 μ were obtained. Samples were made from each fraction by mixing the powder with a binder and by placing this mixture in a disk-like form and allowing it to set between two poles of an electromagnet. In this way magnetically textured samples were obtained whose texture axis lay along the direction of the electromagnet field. Magnetic properties were measured between 20 and -150 °C using a ballistic throw method. Samples were demagnetized at the temperature at which a particular set of measurements were carried out by a suitable constant magnetic field in the reverse direction. The angular dependences of the coercive force and residual magnetization were obtained, magnetization curves were recorded and dependence of the residual magnetization (for partial magnetization cycles) on the magnitude of

Card
2/5

67753

SOV/126-8-5-5/29

The Temperature Dependence of Magnetic Properties of MnBi Alloy Powder Samples with Magnetic Texture

the maximum field used to magnetize the sample were found. The main results are given in Figs 1-4. Fig 1 shows the angular dependence of the coercive force of a sample made from powder with 6 μ particle size at temperatures of +20, -40, -65, -90 and -150 °C (curves 1-5 respectively). The abscissa represents φ which is the angle between the texture axis and the direction of the magnetic field used in measurements. The ordinate represents the ratio of the coercive force H_c measured in the direction of φ and the coercive force, H_c^0 , along the texture axis ($\varphi = 0^\circ$). Fig 2 shows the angular dependence of the relative coercive force, H_c/H_c^0 , of samples made of powders with particle sizes of 20, 6, 3 and 2 μ (curves 1-4 respectively); all the results in Fig 2 were obtained at -65 °C. Fig 3 shows the temperature dependence of the relative residual magnetization (defined as the ratio of the residual magnetization I_r to the saturation magnetization I_s) along the texture axis of samples made of

Card
3/5

67753

SOV/126-8-5-5/29

The Temperature Dependence of Magnetic Properties of MnBi Alloy Powder Samples with Magnetic Texture

powders with 30 and 3 μ particle size (curves 1 and 2 respectively). Fig 4a shows the 20 °C dependence of the relative magnetization I/I_s (curve 1) and the relative residual magnetization I_r/I_s (curve 2) on the magnetic field intensity along the texture axis (The results of Figs 4a, 4b and 4B all refer to a sample made of powder with 6 μ particle size). Figs 4b and 4B give the same dependences at -37 °C and at -60 °C. The authors draw the following conclusions from their results. 1) On lowering of temperature the curves representing the angular dependence of the coercive force depart more and more from the theoretical curve $H_c(\psi)$ for a monodomain sample. This is due to a decrease of the anisotropy constant and consequent lowering of the magnitude of d_{cr} as a result of which the magnetic structure of powder particles changes gradually from monodomain to polydomain type. 2) At room temperature, when the anisotropy constant K and the critical particle size d_{cr} are large, the residual magnetization produced by partial magnetization ✓

Card
4/5

67753

OV/126-8-5-5/29

The Temperature Dependence of Magnetic Properties of MnBi Alloy
Powder Samples with Magnetic Texture

cycles is close to the maximum magnetization of a complete cycle and the maximum residual magnetization is reached in the saturation field, i.e. the magnetic structure is practically monodomain. On lowering of temperature the values of K and d_{cr} decrease and the maximum residual magnetization remains close to the saturation magnetization but is reached in fields larger than the saturation field (transition structure). At low temperatures, i.e. when K and d_{cr} are low, the residual magnetization is small and is reached in fields lower than the saturation field (polydomain structure).

Card
5/5

There are 4 figures and 5 references, of which 3 are Soviet, 1 is English and 1 is French.

ASSOCIATION: Institut fiziki metallov, AN SSSR
(Institute of Physics of Metals, Academy of Sciences
USSR)

SUBMITTED: July 18, 1959

14 6175-
 07/126-8-5-6/29
 AUTHORS: Shur, Ya.S., Shtol'ts, Ye.V. and Glazer, A.A.
 TITLE: Change in the Domain Structure of Magnetically
 Uniaxial Ferromagnetics in a Magnetic Field
 PERIODICAL: Fizika metallov i metallovedeniye, Vol 8, 1959, Nr 5,
 pp 685-688 (USSR)
 ABSTRACT: Powder patterns, representing domain structure, were
 obtained for an MnBi crystal whose hexagonal axis (easy
 magnetization axis) practically coincides with the
 sample surface. In the absence of an external field the
 whole crystal is seen to consist of domains, whose
 boundaries appear as black lines due to powder deposits
 (Fig 1a); these boundaries separate regions with
 antiparallel orientation of magnetization \bar{I}_s . When
 a magnetic field is applied at right angles to \bar{I}_s and
 gradually increased to 600 Oe (Fig 1b) the powder
 deposits at some domain boundaries become broader and
 thinner at others. A further increase of the applied
 field to 3000 Oe (Fig 1B) produces complete disappearance
 of those boundaries which were gradually becoming thinner
 and thinner. Such a change in the domain structure
 contradicts the accepted theories, indicating that the

Card
 1/1

67754

30V/126-8-5-6/29

A Change in the Domain Structure of Magnetically Uniaxial
Ferromagnetics in a Magnetic Field

results obtained by the powder-pattern technique in strong fields are open to question. For this reason the authors studied domain structure of MnBi in two ways: using the powder-pattern technique and the magneto-optical polar Kerr effect (Ref 3). The latter technique showed the domain surfaces rather than the domain boundaries. The Kerr effect results are shown in Fig 2. Fig 2a represents the domain structure in zero external field; the boundaries between the dark and light regions coincide exactly with the boundaries found by the powder-pattern technique (Fig 1a). The Kerr effect shows (Fig 2b) that application of a 3000 Oe field at right angles to the domain boundaries does not affect the initial domain structure. Both methods of domain-structure study can be used simultaneously: domains are revealed by the Kerr effect in a polarizing microscope and the same microscope is used to observe simultaneously the magnetic powder patterns. The results (Fig 3) show clearly that in strong fields the powder-pattern

Card
2/4

6775.

307/126-3-5-4/22

A Change in the Domain Structure of Magnetically Uniaxial
Ferromagnetics in a Magnetic Field

magnetically uniaxial crystals when the latter are subjected to magnetic fields at right angles to the easy magnetization axis. One possible reason for this effect may be an interaction between the external magnetic field and the ferromagnetic particles used in the powder-pattern technique (Ref 2). It is also possible that the effect is due to some complex processes occurring at the domain boundaries themselves. Using the Kerr effect the authors found that when fields of increasing intensity are applied at right angles to the easy-magnetization axis the domains are gradually distorted, are split into smaller parts and finally disappear on approach to saturation. The authors conclude that the magnetization process in a magnetically uniaxial ferromagnetic in field at right angles to the easy magnetization axis involves rotation of the magnetization vector in each domain in such a way as to reach alignment with the field direction. There are 3 figures and 3 references, of which 2 are English and 1 mixed (English and Russian).

Card
3/4

67754

SOV/126-8-5-6/29

A Change in the Domain Structure of Magnetically Uniaxial
Ferromagnetics in a Magnetic Field

ASSOCIATION: Institut fiziki metallov AN SSSR
(Institute of Physics of Metals, Academy of
Sciences, USSR)

SUBMITTED: August 21, 1959

Card 4/4

SHUR, Ya.S.; SHTOL'TS, Ye.V.; MARGOLINA, V.I.

Magnetic structure of small monocrystalline particles of Mn-Bi alloy. Zhur. eksp. i teor. fiz. 38 no.1:46-50 Jan '60.
(MIRA 14:9)

1. Institut fiziki metallov Akademii nauk SSSR.
(Manganese-bismuth alloys--Magnetic properties)

31600

S/048/61/025/012/004/022
B102/B138

24.2200

AUTHORS:

Shtol'ts, Ye. V., Glazer, A. A., and Shur, Ya. S.

TITLE:

Variation of the process of magnetic reversal when the dimensions of ferromagnetic particles are reduced

PERIODICAL:

Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 25, no. 12, 1961, 1445 - 1448

TEXT: That the coercive force of ferromagnetic powders increases with decreasing grain size is already known, but the nature of this effect remains unknown. In this study magnetic reversal was studied on MnBi powder as it has high anisotropy, which permits visual observation of magnetic reversal even in single-domain particles. Since MnBi is magnetically uniaxial, pseudo-monocrystalline specimens could be produced with the following particle sizes (coercive forces): 100.20μ (200 oe) 70.20μ (600 oe), 16.3μ (2,900 oe) and 4.4μ (12,500 oe). For these four types photographs were made of powder deposits in various states of magnetization at fields of up to 21,700 oe. The relative residual magnetization was determined for all size groups: 0.21, 0.54, 0.73 and 0.96 was found. The magnetic reversal

Card 1/2

Variation of the process of...

31600
S/048/61/025/012/004/022
B102/B138

nucleation process was studied carefully. As there is considerable difficulty in nucleation no further increase in field strength is required for growth of nuclei. This explains the irregular rearrangement of the domain structure. The increase in coercive force is attributed to the difficulties of nucleation. There are 3 figures, 1 table, and 7 references: 6 Soviet and 1 non-Soviet. The reference to the English-language publication reads as follows: H. Amar, J. Appl. Phys. 29, 542, 1958. X

Card 2/2

24,22-00
S/126/62/013/003/005/023
E039/E135

AUTHORS: Shtol'ts, Ye.V., and Shur, Ya.S.

TITLE: On the process of magnetic reversal in single crystal particles of the alloy MnBi.

PERIODICAL: Fizika metallov i metallovedeniye, v.13, no.3, 1962, 359-364

TEXT: It is well known that as the size of particles of ferromagnetic substance is decreased the coercive force increases. Hence, in fine powders in which the particles have a large magnetic anisotropy, very high values of coercive force can be obtained. The physical nature of this effect has not been sufficiently studied. Previous work was hampered because of the difficulty in preparing samples of pseudo-crystals in which the single crystal particles are orientated in space. In this work the difficulty was overcome by using the ferromagnetic alloy MnBi prepared by sintering powdered Mn and Bi in a magnetic field. The particle size was changed by sintering at different temperatures. It is shown that the formation of the magnetic

Card 1/3

On the process of magnetic reversal ... S/126/62/013/003/005/023
EO39/E135

phase begins at about 250 °C, maximum magnetic saturation being reached at 300 °C. Curves are obtained for magnetisation along and at right angles to the magnetic axis. In the former case saturation is reached in a field of about 5000 oersted, while in the latter it only reaches 50% saturation at 20 000 oersted. By decreasing the size of the particles from 100 x 19 to 16 x 3 microns the coercive force along the axis increased from 200 to 2900 oersted and values of relative residual magnetisation increased from 0.21 to 0.71. The dependence of the coercive force on the angle ψ between the texture axis and the direction of the magnetising field was investigated. It is shown that for samples with dimensions 100 x 19 to 70 x 19 microns the maximum coercive force occurs for an angle $\psi = 90^\circ$, whereas for particle sizes of 19 x 4 and 16 x 3 microns the maximum coercive force occurs at $\psi = 45$ to 60° . On comparing these results with theory for samples 100 x 19 microns the agreement is good up to $\psi = 60$ to 70° ; for larger values of ψ the experimental curve falls below the theoretical one. For particles of

Card 2/3

On the process of magnetic reversal.. S/126/62/013/003/005/023
E039/E135

16 x 3 microns the agreement is good only up to $\varphi = 30$ to 40° ,
after which the experimental curve decreases. It is concluded
that for large values of φ the magnetisation process occurs
as a result of an irreversible rotation of the magnetisation
vector in the particles.
There are 7 figures and 1 table.

ASSOCIATION: Institut fiziki metallov AN SSSR
(Institute of Physics of Metals, AS USSR)

SUBMITTED: July 25, 1961

Card. 3/3

42248

S/126/62/014/004/006/017
E039/E435

24.2200

AUTHORS: Shur, Ya.S., Glazer, A.A., Shtol'ts, Ye.V.
TITLE: On the nature of the temperature instability of the
residual induction in powdered MnBi alloy permanent
magnets

PERIODICAL: Fizika metallov i metallovedeniy, v.14, no.4, 1962,
523-528

TEXT: The temperature dependence of the domain structure of
small particles of MnBi alloy with residual magnetization is
studied by means of the Kerr effect over the range $\pm 200^{\circ}\text{C}$.
Three particle sizes are investigated (samples 1, 2 and 3
of 6, 20 and 30 μ respectively), the coarse particles having a
multidomain structure while the finer particles are single domain
at room temperature. Critical temperatures are found for the
transition from single to multidomain structure, which are lower
for the smaller particles. The temperature dependence of the
relative residual magnetization I_r/I_s (I_r is the residual
magnetization and I_s the saturated magnetization) is also
determined. At 20°C the values of I_r/I_s for samples 1, 2 and 3
Card 1/2

On the nature of the temperature ...

S/126/62/014/004/006/017
E039/E435

were 0.95, 0.91 and 0.78 respectively. On cooling to -42°C the value of I_r/I_s for sample 3 decreased to 0.15 and for sample 2 to 0.55 while the value for sample 1 remained unchanged. Further reduction in temperature led to a decrease in I_r/I_s for sample 1 also. It is shown that there is an irreversible decrease in the residual induction on cooling due to the transition from multi to single domain type of structure. In order to prevent this effect occurring in magnets for technical applications it is essential to use very small particle sizes. There are 4 figures.

ASSOCIATION: Institut fiziki metallov AN SSSR
(Institute of Physics of Metals AS USSR)

SUBMITTED: May 6, 1962

S/048/62/026/002/018/032
B106/B104

Temperature dependence of transition...

tenth its value as temperature decreases from +20 to -150°C, while I_s increases by 5 %. The boundary energy associated with the value of K can therefore be varied within a wide range by varying temperature whereas the magnetic charges remain practically unchanged. The domain structure of specimens described earlier (Ref. 1) has been studied by the polar magnetooptical Kerr effect. Remagnetization at room temperature after magnetization of the particle by a strong field (some 10^5 oe) was visually observed. The magnitude of the negative magnetic field at which sudden remagnetization occurs was determined (this field is practically equal to the coercive force). By the same magnetic field the particle was then brought to residual magnetization and cooled with liquid nitrogen. The changes in domain structure during the cooling were observed. Two different particles showed at -15 and -42°C, respectively, a sudden division into domains which turned out to be irreversible through subsequent temperature increase. The amount of this new domain phase was about equal to the quantity of original domain phase in the demagnetized state at room temperature. Remagnetization at room temperature of the particle with the lower splitting temperature has been effected only by a stronger magnetic field than in those cases with the other particles. In similar experiments it

Temperature dependence of transition...

S/048/62/026/002/018/032
B106/B104

was established that the temperature of splitting into domains decreases with increasing coercive force of the particle with transition structure. Some particles heated to $+200^{\circ}\text{C}$ did not split into domains. The results are interpreted as follows: In the case of magnetization at room temperature by a field that is strong enough to suppress nuclei of remagnetization the particle remains in the state of residual magnetization. Owing to the decrease of the coefficient of anisotropy, boundary energy decreases on cooling and new remagnetization nuclei will form leading to transition into domain structure at a certain temperature. This process is jump-like because it leads from a metastable to a stable state. The formation of remagnetization nuclei is inhibited with increasing coercive force. One therefore has to cool lower to achieve transition into domain structure. K does not decrease on heating to 200°C and consequently does not reduce the boundary energy. From these results the authors infer that inhibition of remagnetization nucleus formation is the reason for the occurrence of a transition structure. Such an inhibition may occur at high boundary energy densities. A. S. Yermolenko is mentioned. There are 2 figures and 5 references: 2 Soviet and 3 non-Soviet. The reference to the English-language publication reads as follows: Roberts B. W. Bean C. P., Phys. Rev., 96, 1494 (1954). ✓

Card 3/3

34182

S/O48/62/026/002/032/032
B117/B138

24,2200 (1147,1164,1482)

AUTHOR: Shtol'ts, Ye. V.

TITLE: On the nature of the high-coercivity state in barium ferrite

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26,
no. 2, 1962, 317 - 320

TEXT: This paper was presented at a conference on magnetism and antiferromagnetism. The authors studied the magnetic properties of sintered ferrite particles in order to ascertain the nature of the high coercive force in this material. They produced powder from coarse grained barium ferrite sintered at 1400°C ($H_c = 20$ oe) and from fine grained barium ferrite sintered at 1200°C ($H_c = 2000$ oe). The particle size of the finest powder was

1 - 2μ . The magnetic properties were studied in pseudo single crystals. The method of producing such specimens has already been described (Ref. 4: Shur, Ya. S., Shtol'ts, Ye. V., Kandaurova, G. S., Fiz. metallov i metallovedeniye 2, 421 (1957)). The measurements were made ballistically. If the size of barium ferrite crystallites sintered at 1400°C is reduced to a
Card 1/2

L 00751-66 EWP(e)/ENT(m)/ENP(w)/ENA(d)/T/ENP(t)/ENP(k)/ENP(z)/ENP(b)/ENA(c)
IJP(c) JD

ACCESSION NR: AP5012564 ~~UR/0181/65/007/005/1495/1500~~

AUTHOR: Shtol'ts, Ye. V. ^{44,57}

TITLE: On the asymmetry of the hysteresis loops in small particles of MnBi alloy ^{34 35 B}

SOURCE: Fizika tverdogo tela, v. 7, no. 5, 1965, 1495-1500 ²⁷⁻²⁷

TOPIC TAGS: hysteresis loop, metal powder, manganese alloy, bismuth alloy, demagnetization, magnetic domain structure ^{55, 64 27}

ABSTRACT: The author measured partial cycles of hysteresis loops of powders of MnBi alloys with different particle dimensions, in order to check on the hypothesis advanced on the basis of earlier experiments (FMM v. 5, 421, 1957) that the character of the hysteresis loop depends on the method of demagnetization in the MnBi particles. The magnetic properties were measured by a ballistic-throw method using pseudo-single-crystal/powdered samples. The results showed that in weak magnetic fields, in which the saturation by the positive magnetic field was not yet reached, the partial hysteresis cycles at -196C are symmetrical with respect to the coordinate axis, but after demagnetization at room temperature by a reverse magnetic field the partial cycles become asymmetrical, with the asymmetry increasing with increasing particle size. In medium magnetic fields, in which saturation magnetization and maximum residual magnetization is attained with a positive field, the

L 00754-66

ACCESSION NR: AP5012564

4
partial cycles exhibit a sharp asymmetry with respect to the coordinate axes. It is concluded on this basis that the symmetry or asymmetry of the hysteresis loop depends on the initial domain structure. If the change in the magnetization in weak fields occurs only by shifting of the domain boundaries, then the hysteresis loops are symmetrical. If the area of the domain boundaries changes, then the hysteresis loops become asymmetrical. Orig. art. has: 4 figures.

ASSOCIATION: Institut fiziki metallov, Sverdlovsk (Institute of Metal Physics)

SUBMITTED: 18Dec64

ENCL: 00

SUB CODE: MM, EM

NR REF SOV: 002

OTHER: 001

Magnetic Material 18

L 9646-66 EWT(1)/EWT(m)/EWA(d)/I/EWP(t)/EWP(z)/EWP(h)/EWA(z) ~~EE(-)~~ ~~EE~~
 ACC NR: AP5025381 SOURCE CODE: UR/0181/65/007/010/3019/3025 ⁶³

⁴⁴
 AUTHOR: Shtol'ts, Ye. V. ⁶⁵

ORG: Institute of Physics of Metals AN SSSR, Sverdlovsk (Institut fiziki metallov AN SSSR) ⁴⁴ ⁶⁵

TITLE: Incipient formation of the polydomain state in particles with a transitional structure

SOURCE: Fizika tverdogo tela, v. 7, no. 10, 1965, 3019-3025

TOPIC TAGS: ⁶⁵ manganese alloy, bismuth alloy, ^{21, 40, 55} magnetic domain structure, magnetic anisotropy, ⁵⁶ magnetic field ^{21, 40, 55}

ABSTRACT: The author studies the mechanism responsible for formation of the polydomain state in particles of MnBi alloy with transitional structure. The domain structure of individual particles in pseudo-single crystal powder specimens of MnBi (in the form of discs) was observed in the plane parallel to the hexagonal axis in a horizontal magnetic field, and in the basal plane in a vertical magnetic field. The maximum magnetic field strength was 22,000 oersteds. The Kerr effect was used for all observations. Particular attention was devoted to the domain structure in the basal plane. The experimental equipment is described and a diagram is given. The strength of the magnetic field accompanying the polydomain state was studied as a

Card 1/2

L 9646-66

ACC NR: AP5025381

function of the angle between the preferred axis of magnetization and the direction of the magnetic field. Differences in the forms of the domain structures observed in positive and negative magnetic fields indicate that a different mechanism is responsible in each of these cases. It was found that in the case of a positive magnetic field formation of the polydomain structure is preceded by rotation of the direction of magnetization in a small surface layer of the particle. When the applied magnetic field is negative, the polydomain state is preceded by rotation of the direction of magnetization throughout the entire particle. It is believed that this is the first time that this second mechanism has been reported. Orig. art. has: 5 figures, 1 table.

SUB CODE: 20/

SUBM DATE: 03May65/

ORIG REF: 004/

OTH REF: 002

Magnetic Material 12

BC

2/2

REF ID: A660010
 SOURCE CODE: UR/0048/66/030/006/1042/1045

REPORT: Sverdlovsk, No. V.

ORG: NONE

TITLE: Concerning the formation of polydomain states in ferromagnets /Report, All-Union Conference on the Physics of Ferro- and Antiferromagnetism held 2-7 July 1965 in Sverdlovsk/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 30, no. 6, 1966, 1042-1045

TOPIC TAGS: ferromagnetism, ferromagnetic structure, magnetic domain structure, manganese alloy, bismuth alloy, cobalt compound, lead compound, ferrite

ABSTRACT: The author has investigated with the aid of the Kerr magneto-optical effect the changes in the domain structure in the basal plane of Mn-Bi alloy particles under switching with the magnetizing field parallel to an easy magnetization axis, and with the aid of the powder pattern technique, the change in the domain structure in different planes of magnetoplumbite single crystals with the magnetizing field perpendicular to the easy magnetization axis, and in the (110) plane of cobalt ferrite single crystals with the magnetizing field parallel [110]. It was found that in all three cases the polydomain state arises under certain conditions without apparent nucleation. The con-

L 08762-67

ACC NR: AP6029125

clusion of G.S.Kandaurova and Ya.S.Shur (Izv. AN SSSR Ser. fiz., 30, 1030 (1966)/see Abstract AP6029126/) that nucleation takes place in magnetoplumbite even when the magnetizing field is parallel to [0001] is discussed and shown to be not well founded. The most striking behavior was evinced by the Mn-Bi alloy particles. When these particles were magnetized in a 10 kOe field and the magnetizing field was reduced to 3.8 kOe, a maze type domain structure arose by nucleation. When the particle was magnetized in a 20 kOe field, however, it remained a single domain as the magnetizing field was reduced through zero and until the magnetizing field reached the value of 3.6 kOe in the opposite direction, when there suddenly arose a polydomain state consisting of a large single domain penetrated by many small domains of opposite magnetization. It is concluded that polydomain states can arise in ferromagnets without nucleation, and it is suggested that such states arise as a result of nonuniform rotation of the magnetization vector in different parts of the specimen. Orig. art. has: 3 figures.

SUB CODE: 20/

SUBM DATE: 00/

ORIG REF: 007/

OTH REF: 001

ACC NR: AP6036948

(A, N)

SOURCE CODE: UR/0181/66/008/011/3147/3155

AUTHOR: Shtol'ts, Ye. V.

ORG: Institute of Metal Physics AN SSSR, Sverdlovsk (Institut fiziki metallov AN SSSR)

TITLE: Domain structure of cobalt ferrite

SOURCE: Fizika tverdogo tela, v. 8, no. 11, 1966, 3147-3155

TOPIC TAGS: magnetic domain structure, magnetic domain boundary, ferrite, cobalt compound, magnetization

ABSTRACT: The aim of the work was to examine visually changes in domain structure occurring during alternating magnetization of a cobalt ferrite single crystal ($\text{Co}_{0.7}\text{Fe}_{2.3}\text{O}_4$) annealed in a magnetic field. The alternating magnetization was carried out along the axis of easiest magnetization and in directions perpendicular to it. The following observations were made: (1) During alternating magnetization along the axis of easiest magnetization, the domain structure consists of planar domains; the 180° boundaries between the latter are located on $\{110\}$ planes parallel to the axis of easiest magnetization. The domain structure resembles that of uniaxial ferromagnetics. (2) During magnetic reversal along $\langle 100 \rangle$, perpendicular to the easiest magnetization, two types of domain structure exist: a structure of domains separated by 90° boundaries located on $\{110\}$ planes, and in weaker fields, a structure of

ACC NR: AP6036948

domains separated by 180° boundaries located on (100) planes, perpendicular to the direction of the magnetic field. (3) During alternating magnetization along $\langle 110 \rangle$, which is perpendicular to the easiest magnetization, close to saturation, the crystal consists of domains separated by 90° boundaries whose plane is perpendicular to the direction of the magnetic field. (4) The hysteresis loops for $H \dots H_{ht}$ (H_{ht} being the magnetic field applied during heat treatment) are stretched out due to the characteristics of the domain structure of the cobalt ferrite. Authors are sincerely grateful to T. M. Perekalina for providing the single crystals for the study and to L. M. Magat for determining the orientation of the single crystals. Orig. art. has: 7 figures.

SUB CODE: 20/ SUBM DATE: 15Dec65/ ORIG REF: 003/ OTH REF: 004

ACC NR: AIG037009

SOURCE CODE: UR/0181/66/008/011/3416/3418

AUTHOR: Shtol'ts, Ye. V.

ORG: Institute of Physics of Metals, AN SSSR, Sverdlovsk (Institut fiziki metallov AN SSSR)

TITLE: On the process of reversal of magnetization in barium ferrite powders

SOURCE: Fizika tverdogo tela, v. 8, no. 11, 1966, 3416-3418

TOPIC TAGS: barium compound, ferrite, magnetization, magnetic coercive force, magnetic domain structure

ABSTRACT: The purpose of the investigation was to determine the size of the crystallites and the influence of the state of the crystal structure of barium ferrite on its magnetic properties. The powders were prepared from large-crystal textured barium ferrite sintered at 1200C ($H_c = 15$ and 2000 Oe, respectively). Plots were taken of the temperature dependence of the coercive force of the two types of ferrites, and showed that with decreasing particle size H_c increases at all angles. The increase in the direction of the texture axis is by a factor of twenty, and in the direction perpendicular to it by a factor of ten. Furthermore, in the case of the ferrite sintered at 1400C, the residual magnetization σ_r/σ_s increased in all directions. In the case of the barium ferrite sintered at 1200C, σ_r/σ_s remains constant at $\varphi = 0^\circ$ and decreases somewhat at $\varphi = 90^\circ$. The coercive force decreases with decreasing grain size for all values of φ . The results are interpreted from the

ACC NR: AP6037009

point of view of the domain structure of the powders and by comparison with results obtained for other ferrites. It is concluded that the magnetic properties of barium ferrite and its powders are determined essentially by the dimensions of the crystallites if the reversal of magnetization is via an increase in the remagnetization nuclei and a shift of the boundaries between domains, and by the states of the crystal structure if the reversal of magnetization is via inhomogeneous rotation of the magnetization vector. Other evidence is presented favoring the hypothesis that the inhomogeneous rotation of the magnetization vector plays an important role in the reversal of magnetization in the direction of the easy magnetization of highly-coercive barium ferrite. The authors thank L. Ya. Shchepkin for supplying the initial materials for the investigation. Orig. art. has: 2 figures and 1 table.

SUB CODE: 20/

SUBM DATE: 08Feb66/

ORIG REF: 004/

OTH REF: 001

SHTOL'TSEL', K.

Combustible cores. Lit. proizv. 5:5-7 My '64.

(MIRA 18:3)

SHTOL'TSER, N.G., kand.tekhn.nauk

Choice of an optimum motor for drives with frequent starts. Vest.
elektroprom. 31 no.12:67-69 D '60. (MIRA 14:2)
(Electric motors) (Electric driving)

SHTOL'TSER, N.G.

Determining the slip s_{max} corresponding to the maximum moment M_{m}
of an asynchronous motor. Nauch. trudy LTA no. 97:71-74 '62.
(MIRA 17:2)

MAZURIN, O.V.; GOLIKOVA, E.V.; SHTOL'TSER, N.V.

Effect of calcium oxide on the electric conductivity of glasses
containing two alkali metal oxides. Fiz. tver. tela 1 no.4:630-631
'59. (MIRA 12:6)

(Calcium oxide) (Glass--Electric properties)

SHTOL'TSER, V.R., nauchnyy sotrudnik

Effect of the electrical field of ultrahigh-frequency current on
hemopoiesis in healthy rabbits. Akt.vop.perel.krovi no.4:214-216
'55. (MIRA 13:1)

1. Rukovoditel' - chlen-korrespondent AMN SSSR, prof. I.R. Petrov
i prof. I.S. Sherman.

(ELECTRIC FIELDS--PHYSIOLOGICAL EFFECT)
(HEMPOIETIC SYSTEM)

USOL'TSEVA, Ye.V.; GOLOVINA, Ye.P.; SHTOL'TSER, V.R.

Effect of heat and cold in the treatment of bruises and strain of
the soft tissues. Sov.med. 21 Supplement:6 '57. (MIRA 11:2)

1. Iz Leningradskogo nauchno-issledovatel'skogo instituta
fizioterapii i kurortologii.

(HEAT--PHYSIOLOGICAL EFFECT)

(COLD--THERAPEUTIC USE)

(MUSCLES--WOUNDS AND INJURIES)

SHTOL'TSER, V. R.: Master Med Sci (diss) -- "On the problem of increasing the activity of hemostatic blood preparations from the effects of electrical fields of ultraviolet frequencies". Leningrad, 1958. 14 pp (State Order of Lenin Inst for the Advanced Training of Physicians im S. M. Kirov), 200 copies (KL, No 7, 1959, 130)

SHTOL'TSER, V.R.

Modification of the activity of hemostatic preparations made of blood due to exposure to ultrahigh frequency electric fields. [with summary in English, p.64]. Probl.gemat. i perel.krovi. 3 no.3:38-42 My-Je '58 (MIRA 11:6)

1. Iz Leningradskogo ordena Trudovogo Krasnogo Znameni instituta perelivaniya krovi (dir. - dotsent A.D. Belyakov, nauchnyy rukovoditel' - cilen-korrespondent AMN SSSR prof. A.N. Filatov).

HEMOSTATICS.

eff. of electric ultrahigh frequency fields (Rus))

ELECTRICITY, effects.

ultrahigh frequency fields, on hemostatics (Rus))

SHTOL'TSER, V.R., nauchnyy sotrudnik

Dependence of the activation of plasma, thromboplastin, and hemostatic preparations treated in the ultrahigh-frequency field on the presence of antiseptics. Akt.vop.perel.krovi no.7:168-175 '59. (MIRA 13:1)

1. Laboratoriya sukhikh preparatov krovi (zav. laboratoriyey - prof. L.G. Bogomolova) i fizioterapevticheskoye otdeleniye Leningradskogo instituta perelivaniya krovi.

(BIOLOGICAL PRODUCTS) (ANTISEPTICS) (ELECTROTHERAPEUTICS)

SHTOMBERG, M.S. kandidat meditsinskikh nauk

Hygienic evaluation of working conditions and sanitary methods in
the production urea-formaldehyde resins. Gig. i san., 21 no.7:
45-47 J1 '56. (MIRA 9:9)

1. Iz promyshlennogo otdeleniya sanitarno-epidemiologicheskoi
stantsii Moskvy.

(INDUSTRIAL HYGIENE

in urea-formaldehyde resin prod.)

(RESINS, preparation of

urea-formaldehyde resin indust., indust. hygiene)

ALDYREVA, M.V.; MESHENGISSEY, S.M.; MIRSKIY, M.Ya.; SHTOMBERG, M.S. (Moskva)

Improving labor conditions in intaglio shops of printing plants.
Gig.truda i prof.zab. 3 no.1:51-54 Ja-F '59. (MIRA 12:2)
(BENZENE--TOXICOLOGY)

SHTOKOLOV, L.S.

Heat-transfer crisis in the boiling of ethyl alcohol at high
flow velocities. Inzh.-fiz. zhur. 7 no.12:3-7 D '64

(MIRA 18:2)

1. Institut teplofiziki, Novosibirsk.

PIUNOVSKIY, I.I., kand. tekhn. nauk; ZHIVOTKO, B.I., kand. tekhn. nauk; RUKTESHEL', S.V., kand. tekhn. nauk; SHTOMPEL', B.N., kand. tekhn. nauk; BUTVILOVSKIY, F.A., inzh.; KORZHENEVSKAYA, R.A., inzh.; LOGVINOVICH, I.P., inzh.; UTEVSKAYA, L.I., kand. tekhn. nauk; RUNISO, A.A., kand. tekhn. nauk; NAGORSKIY, I.S., kand. tekhn. nauk; TERPILOVSKIY, K.F., kand. tekhn. nauk; LOSEV, V.I., kand. tekhn. nauk; YAROSHEVICH, A.A., kand. tekhn. nauk; KATSYGIN, V.V., kand. tekhn. nauk, red.; BOROVNIKOVA, R., red.

[Problems of the technology of mechanized agricultural production] Voprosy tekhnologii mekhanizirovannogo sel'skokhoziaistvennogo proizvodstva. Minsk, Izd-vo "Urozhai." Pt.2. 1964. 336 p. (MIRA 17:7)

1. Tsentral'nyy nauchno-issledovatel'skiy institut mekhanizatsii i elektrifikatsii sel'skogo khozyaystva nechernozemnoy zony SSSR.

SHTOMPEL, N.
KORETSKIY, I.; SHALIMOV, A.; VIL'CHINSKIY, V.; SHTOMPEL', N.; MOLEV, G.

The regional economic councils and labor problems. Sots.trud
no.11:85-101 N '57. (MIRA 10:12)

1. Nachal'nik otдела truda i zarabotnoy platy metallurgicheskogo kombinata imeni Serova, Sverdlovskiy rayon (for Koretskiy).
 2. Nachal'nik otдела organizatsii truda tresta "Dzerzhinskruka" (for Shalimov).
 3. Nachal'nik otдела rabochikh kadrov, truda i zarabotnoy platy Zaporozhskogo sovnarkhoza (for Vil'chinskiy).
 4. Nachal'nik otдела rabochikh kadrov, truda i zarabotnoy platy upravleniya stroitel'stva i promyshlennosti stroitel'nykh materialov Zaporozhskogo sovnarkhoza (for Shtompel').
 5. Nachal'nik otдела truda i zarabotnoy platy Moldavskogo sovnarkhoza (for Molev).
- (Russia--Industries) (Labor productivity)

CHTOMPEL', M. V.

Building

Introducing over-all Stakhanov work method in building construction. Sbor. mat. o
nov. tekhn. v stroi. 15, No. 3, 1953.

9. Monthly List of Russian Accessions, Library of Congress, June 1953, Uncl.

SHTOMPEL', N.V.

Erecting large reinforced concrete roof slabs with the aid of
a three-level tie beam. Biul.stroi.tekh. 14 no.6:24-25 Je '57.
(MIRA 10:11)

1. Nauchno-issledovatel'skiy sektor tresta Zaporozhstroy.
(Zaporozhye--Precast concrete construction) (Hoisting machinery)

Founding

Molding the housing and cover of a reducer. Lit prot. 2 No. 8, 1952.

Monthly List of Russian Accessions, Library of Congress, December 1952 UNCLASSIFIED

SHTONDA, P.V., inzhener.

Pouring basin with a float skimming device. Lit.preizv.no.4:26-27
Ap '56. (Foundry machinery and supplies) (MLRA 9:7)

AUTHOR: Shtonda, P.V. SOV/128-58-12-14/21

TITLE: A Metallic Mold for Flasks of Various Heights (Metalliches-
kaya forma dlya opok raznoy vysoty)

PERIODICAL: Liteynoye proizvodstvo, 1958, Nr 12, pp 22 - 23 (USSR)

ABSTRACT: Information is given on a cast-iron combined mold for the
casting of flasks, the use of which requires only a slight
machining of the flask surfaces and considerably increases
labor efficiency. The mold is being used at the "Lenme-
trostroy" Plant. There are 3 diagrams.

Card 1/1

SHTONDE, A.

Improve the design of the K-22A and K22G carburetors. Avt.
transp. 33 no.5:33 My '55. (MLRA 8:8)
(Carburetors)

KOCHO, V.G., doktor tekhn. nauk; MITROKHIN, A.K.; SHTOPKO, V.M.; SHOSTAK,
V.A.; BELKOPYTOV, V.A.; BAZILEVSKIY, A.R.; TOL'SKIY, A.A.

Temperature conditions of a converter bath with air and steam=
oxygen bottom blowing. Met. i gornorud. prom. no.1:21-24
Ja. 8:165. (MIRA 18:3)

1. 53816-65 EWT(1)/EWP(e)/EWT(m)/EWP(1)/EPF(a)-2/EPR/EWP(t)/EPA(bb)-2/EWP(b)
 Pz-6/Pu-4/Pu-4 IJP(g) JD/WW/JG/AT S/0226/65/000/003/0088/0093
 ACCESSION NR: AP5008279

AUTHORS: Kocho, V. S.; Mitrokhin, A. K.; Kislyy, P. S.; Shtopko, V. M.

TITLE: Performance of zirconium boride thermocouple tips in a Bessemer converter

SOURCE: Poroshkovaya metallurgiya, no. 3, 1965, 88-93

TOPIC TAGS: steel industry, smelting temperature/ PR 30/6 thermocouple

ABSTRACT: The use of a multilayer thermocouple shield (made of sintered metal) in a Bessemer converter with an acid lining is discussed. This procedure had been previously used for measuring the temperature in the open hearth furnace and in a converter with nonacid lining. The purpose of this experiment was to develop a continuous temperature-indicating system by using thermocouples PR 30/6. The length of the tip exposed directly to the molten metal was 25 mm; its diameter is not given but appears to be approximately equal to the exposed length in the detail of the thermocouple assembly. This measuring process is compared with others previously used (particularly during several working cycles). An extended temperature-time diagram shows the moment when the bottom of the converter including the thermocouple tip emerges out of the metal. During this period the

L 53816-65

ACCESSION NR: AP5008279

3

thermocouple indicates the temperature of the lining. Deformation of the tip due to mechanical forces limits the use of a sintered zirconium boride tip at 5 to 8 cycles or approximately 2 hours. Orig. art. has: 4 figures.

ASSOCIATION: Kiyevskiy politekhnicheskii institut (Kiev Polytechnic Institute);
Donetskiy institut chernoy metallurgii (Donets Institute for Ferrous Metallurgy);
Institut problem materialovedeniya AN UkrSSR (Institute of Material Science, AN UkrSSR)

SUBMITTED: 11Mar64

ENCL: 00

SUB CODE: M4

NO REF SOV: 008

OTHER: 000

Am.

SHTORM, V.D.

Let us alter specifications for supplying wool. Tekst.prom.15
no.10:69 0'55. (MIRA 8:12)

1. Yuriskonsul't Chernigovskoy fabriki pervichnoy obrabotki
shersti

(Wool industry)

SHTORM, V.D.; LISIN, V.A.; LARINA, N.Ya.

Advanced method of wool sorting. Tekst.prom. no.2:4-8 F '63.
(MIRA 16:4)

1. Direktor Borskoy fabriki pervichnoy obrabotki shersti Gor'kovskogo
soveta narodnogo khozyaystva (for Shtorm). 2. Glavnyy inzhener
Borskoy fabriki pervichnoy obrabotki shersti Gor'kovskogo soveta narodnogo
khozyaystva (for Lisin). 3. Nachal'nik sortiroychnogo tsekha Borskoy
fabriki pervichnoy obrabotki shersti Gor'kovskogo soveta narodnogo
khozyaystva (for Larina).
(Wool—Grading)

SHTORM, V. M.

Technology

Concerning rigging in the naval fleet. Izd. Moskov transport, 1950.

9. MONTHLY LIST OF RUSSIAN ACCESSIONS. Library of Congress, October 1952. Uml.

MAKSIMENKO, Vasilii Pavlovich. Prinimali uchastiye: KAMENSKIY, V.K.;
SUROVIKIN, V.D., vrach-fiziolog; SHEFTEL', M.A., vrach; ZAONEGIN,
V.N., vodolaznyy spetsialist; KUZNETSOV, I.I., vodolaznyy
spetsialist; SHTORM, V.M., vodolaznyy spetsialist; IGOSHIN, M.G.,
red.; KARYAKINA, M.S., tekhn.red.

[Manual for divers engaged in rescue work] Posobie dlia vodolaza-
spasatelia. Moskva, Izd-vo DOSAAF, 1957. 158 p. (MIRA 13:8)
(Diving, Submarine)

SHTORM, V.V., inzhener.

Equipment for successive stressing of reinforcements used in
prestressed reinforced concrete products. Stroitel. mashinostr.
no.9:17-20 S '56. (MLRA 9:11)
(Prestressed concrete)

L 65241-65 EWT(1)/EWT(m)/EWP(1)/T/EWP(b)/EWA(h)/EWP(e) IJP(c) AT/WH

ACCESSION NR: AP5012593

UR/0181/65/607/005/1588/1590

AUTHOR: Kolomiyets, B. T. Piyasova, L. i. Shtourach, L.

TITLE: On the thermal conductivity of semiconductor chalcogenide glasses

SOURCE: Fizika tverdogo tela, v. 7, no. 5, 1965, 1588-1590

TOPIC TAGS: glass property, thermal conductivity, semiconductor material

ABSTRACT: This is claimed to be the first investigation of this subject. The tests were first made on As_2S_3 and As_2Se_3 binary glasses and their solid solutions, synthesized by the method described earlier by one of the authors (Kolomiyets, with B. V. Pavlov, collection "Stekloobraznoye sostoyaniye" [The Vitreous State], AN SSSR, 1960). The thermal conductivity was investigated by a stationary method proposed by Ye. D. Devyatkova and L. S. Stil'bans (ZhTF v. 22, 968, 1952). The measurements were made in a vacuum better than 10^{-3} mm Hg in the temperature interval 150--320K. The results show that the thermal conductivity of As_2Se_3 varies like T^{-1} in the crystalline state, but for the vitreous state it increases with temperature in the same manner as established by Kittel for oxide glasses (Phys. Rev. v. 75, 972, 1949). A factor worthy of attention is that the vitreous state does not exhibit the same decrease in thermal conductivity as is characteristic of solid solutions of semiconductors in the crystalline state. Analysis shows that the ob-

Card 1/2

L 65241-65

ACCESSION NR: AP5012593

9

served value of the thermal conductivity of the As_2S_3 and As_2Se_3 glasses is a lower limit, imposed by the mean free path of the phonons. This explains the experimentally observed facts. "The authors thank L. Gridnyak and M. Nayvirtova for help with the experiments." Orig. art. has: 1 figure, 1 formula, and 1 table.

ASSOCIATION: Fiziko-tehnicheskiy institut im. A. F. Ioffe AN SSSR, Leningrad (Physicotechnical Institute, AN SSSR) 44 55

SUBMITTED: 30Dec64

ENCL: 00

SUB CODE: MT, TD

NR REF SOV: 007

OTHER: 001

mb
Card 2/2

USSR/Medicine - Radiology
Gamma Radiation

SHTOV, D. A.

"Condenser Dosimeter for Roentgen and Gamma Radiation," A. N. Krongaus, D. A. Shtov, and I. M. Parshin

Vest Rentgen i Radiol, No 6, pp 82-87

A portable condenser type dosimeter for measurement of doses of gamma irradiation was developed at the exptl workshops of the State Inst of Roentgenology and Radiology im V. M. Molotov. This dosimeter works on the same principle as the

275T34

"Viktorin" dosimeter. Because of its lightness and compactness it can be conveniently carried or transported from one place to another. Construction of the portable condenser dosimeter is described in some detail and illustrated by photographs, charts, and formulas. The dosimeter has interchangeable ionization chambers for the following types of radiation: normal, weak, soft, and gamma. Control with radioactive substances is carried on in the same manner as with the "GRI"

47302-66 EWT (ig)/EWP (t)/ETI/EWP (k) IJP (e) JD/HW/JG

ACC NR: AP6032054

SOURCE CODE: UR/0148/66/000/009/0153/0157

AUTHOR: Bernshteyn, M. L.; Shtoyden, V.

ORG: Institute of Steels and Alloys, Moscow (Moskovskiy institut stali i splavov)

TITLE: Thermomechanical treatment of EI-612 type heat-resistant steel

SOURCE: IVUZ. Chernaya metallurgiya, no. 9, 1966, 153-157

TOPIC TAGS: nickel chromium alloy, manganese containing alloy, tungsten containing alloy, molybdenum containing alloy, titanium containing alloy, heat resistant alloy, alloy thermomechanical treatment, low temperature thermomechanical treatment, alloy property/EI-612 alloy

ABSTRACT: Experiments have been made to increase the strength of Kh15N35VT⁶ (EI-612) type alloy by increasing the chromium² content up to 20%, additional alloying with molybdenum in amounts of 2, 4 or 6%, and thermomechanical treatment. Steel specimens annealed at 1180C for 2 hr and water quenched were subjected to low-temperature thermomechanical treatment (LTMT), i.e., either cold drawn with 5, 50 or 75% reduction or rolled at 600C with 50% reduction, in both cases followed by aging at 760C for 25 hr or at 600C for 100 hr. LTMT increased significantly the strength of alloys. The alloy with 2% molybdenum, drawn with 50% reduction, had a room-temperature tensile strength of 105 kg/mm² and a yield strength of 81.6 kg/mm² compared to 84.5 and 49 kg/mm², respectively, for conventionally heat-treated specimens. LTMT, however,

Card 1/2

UDC: 669.14.018.45:621.785.53

L 47302-66

ACC NR: AP6032054

reduced the elongation and reduction of area to 14 and 28% compared to 30 and 42% for conventionally treated specimens. In tests at 700C, the difference became insignificant. The reduction of area of specimens rolled at 600C and aged at 600C for 100 hr was 55.6%, much higher in comparison to other heat treatment processes. Both types of LTMT lowered impact strength to 5.7 kg/cm² at 20 or 700C compared to 23.3 kgm/cm² in conventionally heat-treated specimens. LTMT greatly improved the heat resistance. Alloy containing 6% molybdenum, rolled at 600C and aged at 760C for 25 hr, had at 700C under a stress of 25 kg/mm² a rupture life of 1200 hr compared to 179 hr for conventionally treated alloy. Alloy with 4% molybdenum, cold-drawn with 50% reduction and tested at 700C under a stress of 20 kg/mm², failed after 5000 hr, compared to 1700 hr for conventionally treated alloy. Orig. art. has: 4 figures and 2 tables. [AZ]

SUB CODE: 11, 13/ SUBM DATE: 07Aug65/ ORIG REF: 002/ ATD PRESS: 5094

SHCHYKO, D. A.

Stoyushkin, I. A. and Shchovko, D. A. "The experiment in obtaining high yields in Kursk Oblast," (Based on the 1947 data) Sbornik robot Kurskoy obl. kompleks. s.-kh. opyt. stantsii. Kursk, 1949, . . 3-25

SO: U-1034, 22 Oct 53, (Letopis 'Zhurnal 'nykh Statey, No. 16, 1946).

SHTOYKO, D. A.

37407. SHTOYKO, D. A.; ALEKSEEVA, A. O.; i LIKHOLETOV, I..N. Agrotekhnika
Usennego Seva Oziymkh. V Sb: Za Vysokuyu Kul'turu Zemledeliya Kursk,
1949, s. 7-22.

SO: Letopis' Zhrunal'nykh Statey, Vol. 7, 1949

SHTOYKO, D. A.

Shtoyko, D. A. "Lo series of the soil between the rows as a means of regulating the air conditions of the soil in connection with the growth of sugar beets," Sbornik rabot Kurskoy obl. kompleks. s.-kh. opyt. stantsii. Kursk, 1949, p. 37-51. - Bibliog: 30 items

SO: U-1034, 29 Oct 53, (Let pis 'Zhurnal 'nykh Statey, No. 10, 1949).

USSR/Cultivated Plants - Commercial. Oil-Bearing. Sugar-Bearing. M-5

Abs Jour : Ref Zhur - Biol., No 7, 1958, 29956

Author : Shtoyko, D.A.

Inst : The Ukrainian Scientific Research Institute for Irriga-
tional Agriculture.

Title : A Contribution to the Problem of Cultivating Sugar Beets
on the Irrigated Soils of the South of the Ukrainian SSR.

Orig Pub : Byul nauchno-tekhn. inform. Ukr. n.-i. in-t oroshayemogo
zemled., 1957, No 3, 9-12

Abstract : No abstract.

Card 1/1

SHTRAFUN, YA. N

VESTNIK ELEKTROPROMYSHLENNOSTI

Journal of the Electrical Industry

• Nr 10, October, 1956

Elect

SHTRAFUN, YA. N.

D

Special Features of Contactless Protection and Automatic
Devices of Powerful Turbo-Generators When Using an
Independent Source of High Frequency A.C.

Non-linear circuit elements such as chokes, transformers,
magnetic amplifiers etc. operate much better at high
frequency and now that reliable generators for 400 - 500
c/s are available new perspectives of using these contactless
protective devices are opened. The article describes briefly
several kinds of protective and control circuits and various
advantages are claimed.

Zavod "Elektrosila" im. S.M. Kirova

LH

was

SHTRAFUN, Ya.N.

Automatic control of regulation of hydrogenerator excitation.
Elektrosila no.14:40-44 '56. (MIRA 12:12)
(Electric generators) (Automatic control)

SHTRAFUN, Ya.N., kandidat tekhnicheskikh nauk.

Use of nonlinear circuits to improve the parameters of overcurrent
production of generators. Vest.elektroprom. 27 no.2:64-65 P '56.

(MIRA 9:7)

1.Zavod "Elekrosila" imeni S.M.Kirova.
(Electric generators)

AUTHORS: Shtrafun, Ya. M., Docent, Candidate of Technical Sciences, Rostovtseva, M. S. Engineer (Leningrad) SOV/105-58-8-7/2

TITLE: An Investigation of Automatic Excitation Systems of High-Power Turbogenerators With Semiconductor Power Rectifiers (Issledovaniye avtomaticheskoy sistemy возбужdeniya moshchnykh turbogeneratorov s silovymi poluprovodnikovymi vypryamitelyami)

PERIODICAL: Elektrichestvo, 1958, Nr 8, pp. 37-41 (USSR)

ABSTRACT: The development of the power system in the USSR confronted the electrical industry with the task of producing turbo-generators with a power of up to 300 MW and to put them into operation. A new exciter system for 30 MW turbogenerators of the type THF -30 is described. It was developed, produced and subjected to test runs in the plant "Elektrosila". The equipment is mounted in an electric power station of the "Lenenergo". The exciter system is supplied by a three-phase generator of an inductor type having two exciter windings in the stator. The generator operates at a frequency of 500 c. The principal winding of the exciter is connected in series and self-exciting. The second winding - the auxiliary winding - is connected separately. It is used for the initial excitation of the generator and

Card 1/3

An Investigation of Automatic Excitation Systems of High-Power Turbogenerators With Semiconductor Power Rectifiers SOV/105-58-8-7/21

for the balancing of the circuit; it can, however, also be used in the acceleration (forcing) of excitation. The independent exciter winding is supplied from a high-frequency subexciter across a rectifier. The subexciter is excited by a permanent magnet. The generator and the subexciter are on the same shaft as the turbogenerator. The exciter winding of the power generator is supplied from the exciter across a selenium power rectifier. The exciter is laid out in such a manner as to ensure the production of a voltage exceeding the voltage required at the respective mode of operation. This voltage is generated at the nominal rotor current of the turbogenerator by the magnetization of the series-connection exciter winding. This excess of voltage is compensated by the connection of an additional reactive load into the exciter circuit. The automatic control of the excitation of the turbogenerator is performed by a control of the voltage drop in the stator winding of the exciter generator caused by the current of the reactive power coils taken out of it. The degree of magnetization of the coils is modified by the automatic control

Card 2/3

An Investigation of Automatic Excitation Systems of High-Power Turbogenerators With Semiconductor Power Rectifiers SOV/105-58-8-7/21

device of excitation. The fundamental data of the system were determined operationally: the limits of voltage control, which in a static mode of operation is kept constant; the stability of the control of excitation; the slope of voltage rise in the operation of the exciter generator; the determination of the influence of the free rotor current in case of short-circuits in the system. The parameters obtained give the result that the system fully complies with requirements and guarantees the necessary static characteristics. The control process takes a stable course. There are 5 figures and 3 tables.

SUBMITTED: October 31, 1957

1. Generators--Analysis 2. Generators--Excitation 3. Rectifiers
--Performance 4. Electric circuits--Calibration 5. Semiconductors
--Applications

Card 3/3

8 (2)

AUTHOR: Shtrafun, Ya. N., Candidate of SOV/105-59-12-2/23
Technical Sciences, Docent (Leningrad)

TITLE: Possible Directions of Development of Automatically Regulated
Turbogenerator Excitation Systems

PERIODICAL: Elektrichestvo, 1959, Nr 12, pp 10-13 (USSR)

ABSTRACT: The article contains a study of the construction of automatically regulated excitation systems in large synchronous generators and the experiences made in their design and operation. On the strength of the above some directions for further development are pointed out. The system with semiconductor power rectifiers is investigated first. The application of high-frequency a.c. generators in excitation systems of large-size turbogenerators has many advantages, but also drawbacks (Ref 1). The article contains an additional improvement of this system, i.e. the use of an independent excitation of the high-frequency a.c. generator with synchronized compounding (Fig 1). To increase the effectiveness of the compounding in the dynamic operation, the main regulation of the excitation is attained by automatic synchronization of the compounding of the high-frequency

Card 1/3